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Young children's digital literacy practices in the sociocultural contexts of their homes

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Abstract

This socioculturally framed case study investigates the digital literacy practices of two young children in their homes in Finland. The aim is to generate new knowledge about children's digital literacy practices embedded in their family lives and to consider how these practices relate to their emergent literacy learning opportunities. The study asks two questions, 'How do digital technologies and media inform the daily lives of children in their homes? Moreover, how do the sociocultural contexts of homes mediate children's digital literacy practices across operational, cultural, critical and creative dimensions of literacy?' The empirical data collection drew on the 'day-in-the-life' methodology, using a combination of video recordings, photographs, observational field notes and parent interviews. The data were subjected to thematic analysis following an ethnographic logic of enquiry. The findings make visible how children's digital literacy practices are intertwined in families' everyday activities, guided by parental rules and values. The study demonstrates children's operational, cultural and creative digital literacy practices. The study also points out the need for more attention to children's critical engagement in their digital literacy practices.

Keywords

Young children, home, digital literacy practices, sociocultural approach, qualitative research

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Introduction

Digitization permeates the everyday lives of many children across the Global North from a very early age (Chaudron, 2015; Danby et al., 2018; Kumpulainen et al., 2019; Suoninen, 2014). Research has documented how digital technologies and media reshape children's free time, play and interactions and relationships with others, as well as how children discover and make sense of knowledge and themselves (Danby et al., 2018; Erstad et al., 2020; Fleer, 2018; Marsh et al., 2017). Digital technologies and media also have an impact on children's early experiences of literacy, which is increasingly multimodal and requires mastery across a range of modes, including words, images and sound, with a variety of tools and content (Flewitt et al., 2015; Kumpulainen et al., 2018).

Much public debate is preoccupied by questions of risk and vulnerability in digital technologies and media for children, amplified by worries for a childhood in which outdoor and spontaneous play has been lost, with a sense of urgency regarding public policy intervention and control with respect to the explosion of children's media (Livingstone et al., 2017b). At the same time, current concerns about the digital divide no longer relate only to a device or the Internet but also to people's ability to make use of digital media for meaningful and accountable social practices (Tate and Warschauer, 2017). In the midst of these concerns, it is surprising how little is yet known about the ways in which young children use and interact with digital devices in their homes, and how these relate to their literacy practices and emergent literacy learning opportunities (Burnett and Daniels, 2015; Kumpulainen and Gillen, 2017, 2019). Yet, home literacy practices are widely accepted as creating the foundations for children's learning and development (Neumann, 2014). Home is typically the first context for children to experience digital technologies and media (Kervin et al., 2018; Ozturk and Ohi, 2019).

At present, we have little research knowledge about digital devices in early literacy learning in homes, and there is a particular lack of studies focused on children's online navigation as well as children's and parents' critical awareness and evaluation of online spaces and digital content. Likewise, we have little research knowledge regarding whether and how children's everyday use of digital technologies and media leads towards each child's agentic engagement and creative production. While creative activities around and with digital technologies and media suggest new possibilities for children's literacy practices, we know little of how they occur in situ and across time and what they mean in terms of children's literacy learning, particularly among the youngest age group.

In this article, we argue that although knowledge about the pervasiveness and risks of digital technologies in the everyday lives of children is important, this body of knowledge alone is unable to explain what digital engagement means for children's developing literacy; their use of text, images, audio, video and gaming; and their understanding of the world and social relationships. Existing research further fails to explain what implications children's use of digital technologies and media has for their learning and development as a whole (see also Sefton-Green et al., 2016). However, this knowledge is clearly required to guide policy, practice and public debate in furthering efforts to combat adverse outcomes, reduce inequality and increase the benefits for all young children to live, learn and thrive in the digital age.

This study addresses current gaps in the research through an in-depth investigation into two young children's (both children were two years old) digital literacy practices in the everyday lives of their homes in Finland. The study asks, 'How do digital technologies and media inform the daily lives of children in their homes? Moreover, how do the sociocultural contexts of homes mediate children's digital literacy practices across operational, cultural, critical and creative dimensions of literacy?'

Conceptualizing and researching children's digital literacy practices

Our understanding and investigation into young children's digital literacy practices resonates with New Literacy Studies and multimodalities that define literacy as an everyday social practice intrinsically connected to the contexts in which they happen (Street, 1984), and which bring attention to the different modalities involved in communication and meaning-making (Kress, 2011). Accordingly, digital literacy refers to the diversity of young children's literacy practices across technologies and media, involving reading, writing and multimodal communication and meaning-making, often realized through digital play or other playful and creative activities (Arnott, 2016; Fleer, 2018; Marsh et al., 2016). Digital literacy practices can involve accessing, using and analysing texts, in addition to producing and disseminating them while using 'reading' and 'writing' in their broadest definitions. Further, digital literacy describes literacy practices that involve digital technologies and media, but which may also involve and hybridize non-digital tools. Digital literacy practices can cross online/offline and material/immaterial boundaries and, as a consequence, create complex communication trajectories (Burnett et al., 2014; Leander and Sheehy, 2004).

In order to gain an in-depth and contextually situated understanding of young children's digital literacy practices, i.e. how digital technologies and media are part of young children's everyday lives and how they engage in reading, writing and communication with digital technologies in their homes, our study draws on the sociocultural approach (Vygotsky, 1978). The sociocultural view holds that learning is an interactional process in which social practices and artefacts, such as digital devices and content, create a shared semiotic system for joint participation, modes of thinking and learning (Kumpulainen and Renshaw, 2007). From this perspective, history and broader sociocultural contexts frame and give meaning to children's digital literacy practices (Coiro et al., 2008; Lankshear and Knobel, 2011). Therefore, digital literacy practices are culturally and socially embedded and informed by individual and collective values, beliefs and attitudes (Gee, 1999).

Our study also regards children's digital literacy practices as situated and relational, framed by the possibilities for acting within a setting (Kumpulainen and Lipponen, 2010). From a sociocultural perspective, children's interactions with their parents and other important others shape their digital literacy practices, experiences and learning at home (e.g. Neumann, 2014). As previous sociocultural studies have noted, different social contexts hold different rules, objectives, time structures, social interactions and structures of people that mediate children's digital literacy practices and learning opportunities (Sairanen and Kumpulainen, 2014). Children's digital literacy practices are thus closely related to children's agency and power relations (Rainio, 2010; Rajala et al., 2016). Similarly, Kucirkova and Flewitt (2018) define agency as 'the features and affordances in children's use of digital media permitting them (or not) to make choices, to add content, to adopt active and interactive roles with digital features and to (re)negotiate identity' (p. 5).

Drawing on Green's (1988) original three-dimensional model of literacy and extending it to the digital realm beyond traditional literacy (see also Colvert, 2015; Marsh, 2016, 2020), our study holds that digital literacy practices entail at least four intersecting dimensions: operational, cultural, critical and creative. The *operational* dimension points to those elements needed to become a competent meaning-maker and communicator, as in decoding and encoding digital and multimodal texts in various communication contexts and being able to use the various tools these means require. The operational dimension of children's digital literacy practices can involve children identifying and using digital devices and content for different purposes, as well as playing and experimenting with digital tools and content. The *cultural* dimension relates to understanding literacies as cultural practices, including

using different modes and cultural signs in communication and meaning-making and acknowledging the rules and conventions for their use within a specific culture. The cultural dimension can manifest itself in children's digital literacy practices in which they make meaning, communicate and collaborate with others with digital technologies and media in different situations acknowledging cultural norms and rules. The third dimension of the model, the *critical*, refers to critical engagement with multimodal texts and artefacts of all kinds, as well as asking questions about power, intended audience and reception. The critical dimension of children's digital literacy practices can manifest itself when children analyse or reflect upon digital content or tools, or when they consider the safe use of digital technologies and media. In our research, we extend the original three-dimensional model and propose a fourth dimension that recognizes literacy as involving agency and the creation of culture; hence, literacy is not only about socialization into existing cultural practices. This fourth dimension, the *creative*, relates (digital) literacies to agency, which entails children's novel and transformative ways of interacting, communicating and meaning-making with digital technologies for personal, relational and/or collective ends. The creative dimension of children's digital literacies can manifest itself in children's digital play in which on- and offline worlds become intertwined or when the child uses or engages with digital technologies and media in novel, unexpected and transformative ways (Kajamaa and Kumpulainen, 2019). In this study, children's digital practices in the home are analysed in relation to these four dimensions. This four-dimensional model through which we investigate children's digital literacy practices in the home is non-linear and dynamic. Our approach stands in contrast with autonomous approaches to literacy (Street, 1984) in which a focus on skills in isolation is paramount (Marsh et al., 2019).

Research insights into children's digital literacy practices in the home

As digital technologies are becoming increasingly pervasive in many children's lives, there is a need for extended research knowledge on children's digital literacy practices in the home. Emerging research on home literacies suggests how young children's engagement and interactions with digital technologies can contribute to their emergent literacy skills, such as letter name and sound knowledge, early writing, communication and understanding of print concepts (Edwards, 2013; Marsh et al., 2017). The study by Neumann (2014) on pre-schoolers' (aged three to five years) home access and use of touchscreen tablets in Australia showed how children with greater access to tablets

developed emergent literacy, namely letter sound and name writing skills. The study underscores the quality of children's experiences with tablets rather than time spent on tablets for their literacy learning opportunities.

Recent international reviews on children's digital media use in homes suggest that young children have varying degrees of opportunity to engage with, and learn from, digital technologies and media in their homes, depending on how parents frame media use and family interactions with and around media (Kumpulainen and Gillen, 2017, 2019). In addition to parental mediation styles, the available research shows an association between children's engagement with, and learning of, digital literacies and parents' educational, cultural and socio-economic backgrounds and their digital skills and attitudes (e.g., Livingstone et al., 2015). For example, in her study on parental mediation of children's (aged three to five years old) media use in the Netherlands, Piotrowski (2017) concluded that not only is the type of parental mediation (restrictive, active) associated with different types of media use, but the style of mediation is also differentially associated with media use. This study shows how those children actively encouraged by their parents to use educational content were likely to use such content and consume less violent content. Interestingly, the effect size of these relationships was the largest among all of the relationships discovered in this study (Piotrowski, 2017). Overall, research evidence speaks to the importance of the home context and parents' mediation practices for children's digital literacy and learning opportunities before formal schooling (Kumpulainen and Gillen, 2017, 2019).

Existing research also suggests that young children typically demonstrate agency over technology and that digital activities interact with and support children's 'offline' life interests because children use digital media as an enlargement of their activities. In her study, Palaiologou (2016) reported that digital activities were integrated into children's interactions with parents and personal explorations. In an observational study, Given et al. (2016) found evidence that young children can combine digital technologies with their social and dramatic play and their offline literacy and numeracy learning in the home. Overall, few studies have focused their attention on children's agency or creative use of digital media in homes. This lack of research is a serious gap, also implicitly noted by Aliagas and Margallo (2017), who argue that Reader Response models used to understand children's reading responses with storybooks need to be revised because interactive elements offered by digitization increases the child's autonomy, positioning a child 'as a collaborator, storyteller, an author, or an internal character in the fiction' (p. 44).

Also notable in the comprehensive international reviews by Kumpulainen and Gillen (2017, 2019) is that hardly any of the studies identified were situated in Finland. However, Finnish society stands out from the rest of the world concerning its strong emphasis on children's autonomy, agency and play in their lifeworlds (Kumpulainen, 2018). Further, Finland does not have clear policy definitions for children's screen time; rather, public guidance recommends that the child's guardian 'limit the child's media time [to] short moments and [pass] this time together with the child'. The guidance also refers to the parent's use of media and recommends that parents 'pay attention to your own media use so that it does not take away too much of your time from your child' (MLL, 2017). Thus, what it means to 'grow up digital' in the context of Finland, with the distinct trust of parents and the societal value of autonomous and playful childhood, warrants further research attention. In sum, the existing body of research evidence calls for more research and studies with sophisticated research methodologies able to capture the nuanced conditions and processes of children's digital literacy practices, where children's digital creativity and production (as opposed to mere consumption) of culture can emerge, as well as identifying threats and risks in children's interactions with digital media.

Given that the ability to read, write and communicate in multimodal ways, both off- and online, will influence children's futures (Kumpulainen et al., 2018), there is a clear need for more empirical research with robust, ecologically valid and suitable theoretical and analytical frameworks to underpin further research into young children's digital literacy practices in the everyday life of their homes. Countries and cultures differ substantially around the world, and these cultural, demographic, technological, socio-economic, geographic and political differences shape children's lives, both offline and online, necessitating a complex and multidimensional research agenda regarding children's digital lives in the 21st century. The present study joins in these efforts and investigates children's digital literacy practices in Finnish homes as part of DigiLitEY's European-level 'A day in the digital lives of children aged 0–3' project (<http://digilitey.eu/working-groups/wg1-digital-literacy-in-homes-and-communities>).

The study

Research setting and participants

This study is situated in a suburban metropolitan area in southern Finland, with two families who were of Finnish origin and represented middle-to-high

socio-economic backgrounds. Two children, aged two years old, Emilia, female (35 months) and Julia, female (33 months), and their families volunteered to take part in this study. The families represented a convenience sample. The study took place in the autumn 2017 in the children's homes and outdoor areas constituting the child's living environments. In both families, there were two adults. In Family 1, there was one child, and in Family 2, there were two children, the youngest being less than a year. The children's names have been replaced with pseudonyms to ensure their anonymity.

Research methods

The empirical data collection of this study draws on the 'day-in-the-life' methodology (Gillen and Cameron, 2010; Gillen et al., 2007), using a combination of parent interviews, observations, photographs, video recordings and field notes of children's digital literacy practices in the home. Data collection entailed the researchers visiting the children's homes and collecting observational and video data over one full day, with a specific interest in the form of media being used, the time, purpose and place, and the social context, of usage. The data collection started with a preliminary discussion with the parents before entering the home. The first home visit included a preliminary familiarizing discussion with the parent and the child, and the negotiation of consent to participate in the research. In this conversation, the parents were informed about the aims of the study, focused on understanding their everyday practices and the role of digital media in these practices. The researchers also interacted with the child in each family prior to the actual data collection and asked for their verbal consent to take part in the research. In this connection, the child and parents were also informed that they could withdraw from the research at any point.

The second visit was the day-in-the-life visit, when researchers spent one day videoing and observing the child's activities and making field notes from the beginning of the child's day for 4–6 h. The parents were asked not to use digital technologies and media intentionally or encourage their children's media use more than they otherwise would during the research. The researchers avoided participating in the child's activities, although in an ethical, child-friendly manner. We discussed the length of the visit and the length of the videoing with the parents, preventing the child from becoming exhausted by the visit. We also put the camera away when we noticed that the child was disturbed, such as getting nervous about the videoing, or whenever the

parents wanted us to stop. The child was not videoed eating, in the bathroom, or sleeping or going to sleep.

During the third and final visit, the researchers met the parents and showed them a summary video of the recording, and engaged in an informal discussion and a more structured interview about the video. The audio data (altogether 1.8 h) comprising the parents' interviews were recorded for analysis. In sum, the core data corpus of our analysis consisted of the videos and observations from one day in each family home as well as interview data with the parents about the summary video made from the child's day.

Data analysis

We transcribed the day-in-the-life video data (8 h per family) and used the transcripts alongside the video during the analysis process; we complemented the video and observation data with the parent interview data. Altogether, our analysis followed an ethnographic logic of enquiry (Castanheira et al., 2009) in which the data analysis proceeds as a series of cycles and as a multi-step, multi-phase recursive analysis process. First, we investigated the entire data corpus and made content logs – i.e., a time-indexed list of the child's activities over the day with and without digital media. We then analysed the form of media being used by the child, including the time, purpose and place and social context of usage. Then, via thematic analysis (Tesch, 1990), we identified episodes in the day-in-the-life video data that accounted for the children's digital literacy practices in the home with a specific interest in those episodes that demonstrated the operational, cultural, critical and creative dimensions of the children's digital literacy practices.

Before beginning an in-depth analysis, we explored the data within these four broad dimensions of digital literacy practices. Subsequently, conceptual similarities were identified across the data (Carley, 1990). The thematic analysis was performed three times to ensure reliability, and the analysis of each transcript was compared through discussion between the first and second authors of this study. The two researchers worked together to arrive at the final conclusion and resolved any discrepancies in analysis through discussion (Boyatzis, 1998). Final interpretations were modified in subsequent reviews and discussions with the third author of the study.

Results

Our results section begins by addressing the first research question. Namely, we discuss how digital technologies and media were found to inform the daily

lives of the two case study children in their homes. We then turn to discussing the findings of our second research question by considering how the socio-cultural contexts of the children's homes mediated their digital literacy practices along operational, cultural, critical and creative dimensions.

Digital technologies and media in the everyday lives of the case study children

The case of Emilia. Emilia and her family live in a semi-detached house next to a forest. Her family includes herself and a mother and father. Both parents have a master-level education. Emilia's father works full time, while her mother is on parental leave at home with Emilia but will soon return to full-time work. Emilia spends her days at home, although a few times each week, she takes part in the activities of an early childhood education centre near her home. At home, Emilia spends time in her room and around the whole house, and spends time outdoors in their family's yard and the forest nearby. Inside, she plays in her own room or the living room and corridors.

Emilia's parents have a tablet that Emilia uses with her parents and by herself. Also, they have a TV and a laptop. At times, they have a habit of watching TV together on a sofa. Though Emilia does not have free access to the tablet, her parents let her use the device. Sometimes, her mother may also suggest to Emilia when to use the tablet. On some days, Emilia does not use any digital devices. Before Emilia starts to use the tablet, her parents typically inform her of how many minutes she can use it for. According to her parents, the child's use of the media was restricted to 5 min at a time. Her parents also expressed that they did not want Emilia to 'overuse' the tablet or other digital devices, but realized that learning to use digital devices was good for her. The parents also expressed that they were interested in what Emilia was doing with the tablet, and they wanted to become familiar with the content. These explanations of Emilia's engagement with digital media reflect the Finnish orientation of childhood that places value around the child's interests and autonomy.

The case of Julia. Julia, her mother, her father and her younger sister live in a terraced house in a park-like neighbourhood with their own yard, and a yard shared with their neighbours. Julia is allowed to play alone in their yard and the front yard. She is not yet allowed to go to the housing cooperative's yard. Both parents have a master-level education, and Julia's father works full time. Her mother has a full-time job as well, but at the time of the study, she was on parental leave at home taking care of the children. Julia has access to her mother's smartphone and a tablet. She also watches a smart TV. Sometimes

she asks for access, while at other times she is asked if she wants to use the digital devices. Occasionally, her father uses an application lock so that Julia is unable to change the application on the tablet; her mother generally does not use the lock for her. Before using the phone or tablet, her parents negotiate with Julia about the use and the content as well as the duration of use. She uses the devices both by herself and with her parents. Julia's parents want her to use digital media and do not feel it is harmful to her. With digital devices, they want to support Julia's interests – music and dancing – and they find digital media helpful for communicating with relatives and friends. Her parents also emphasized Julia's English learning via English-language programs and applications.

Available digital devices. Our data revealed a number of digital media devices available in both Emilia's and Julia's homes. A digital device is understood in this study as a physical unit of equipment that contains a computer or a microcontroller. These digital devices included a TV set connected to the Internet, a tablet computer and a smartphone. While Emilia had a laptop and digital radio at her disposal, Julia had a digital player that she could also use to sing karaoke. Overall, a tablet and smartphone played key roles in both children's everyday use of digital media (see Table 1). Interestingly, none of the children had digital toys in their homes.

The children used these digital devices both alone and together with a parent. Our analysis of the data indicates that the children's independent use of digital technologies and media was somewhat more typical than joint engagement with a parent/parents, as each child's independent engagement was often framed by the everyday routines of the home, keeping the child engaged while the parent was occupied in domestic matters. In these situations, the children typically asked for permission to use the digital device, or a parent asked whether the child would like to use a certain app or watch a video, for example. Neither of the children used digital devices without permission. The parents also explained that they were aware of when their child was using the device independently, though they did not always know the content or purpose of the use.

In both families, the parents had rules and restrictions for their child's use of digital technologies and media, agreed upon with the children. These conditions addressed the screen time and the nature of digital media content available to the children. Also, in both cases, the children themselves were trusted to regulate their use of digital technologies and media according to jointly agreed rules and time restrictions. In summary, in both families who

Table 1. Digital devices available for the children.

The device	Who
TV-set connected to the Internet	Emilia and Julia
Tablet computer	Emilia and Julia
Smartphone	Emilia and Julia
Laptop	Emilia
Digital radio	Emilia
Digital player	Julia

took part in our study, the children’s use of digital technologies and media was strongly shaped by parental mediation. The use of digital technologies and media in the children’s lives was embedded in the daily rhythms of the families, with regular meal times, play time and outdoor activities. The daily schedule in the families created a safe and structured space for the case study children’s self-initiated and/or adult-initiated activities with digital devices and content.

The nature of activities with digital technologies and media. Both Emilia and Julia were found to use the digital media available to them for different purposes, demonstrating varied digital literacy practices and emergent literacy learning opportunities (see Table 2).

The children used tablets for watching videos (typically children’s TV or YouTube videos), playing games, searching for information online and creating sounds. The children used smartphones to watch videos – also at times self-made and about their own lives – as well as to take photos and to communicate with family members (including grandparents) and friends. We observed the children reading text messages with a parent and writing WhatsApp/text messages with emojis, both with a parent and on their own. The children also made calls to their friends and family members. The children’s use of digital technologies and media included scrolling through a tablet’s launch pad and switching from one application or game to another, with no specific purpose from the outset.

Altogether, these different purposes in which the children’s digital literacy practices were embedded demonstrate a repertoire of operational, cultural and creative engagement with digital literacies. That is, the children were learning to use the digital devices to make and communicate meaning, and they took account of the rules and conventions of their use within the social practice in question. The creative dimension of the children’s digital literacy practices evidenced itself in children’s novel and transformative ways of using digital

Table 2. Activities and the device.

Device	Activity
Tablet or smartphone	Watching videos
Tablet or smartphone	Playing games
Tablet	Searching for information
Smartphone	Taking photos
Smartphone	Watching self-taken photos and videos
Smartphone	Communicating with family members
Smart phone	Reading a text message (or WhatsApp)
Smartphone	Writing a text message (or WhatsApp)
Smartphone	Making a call
Tablet and digital player	Creating and listening to sounds
Tablet	Wondering around through a launch pad or through an app

technologies and media, such as when harnessing emojis in creative ways to communicate experiences about a trip to a zoo with their grandmother with implications for emergent literacy learning.

Our data also suggest that the children's everyday lives were not only permeated by digital technologies and media but also intertwined with other non-digital activities, such as interacting and playing with adults and other children using more traditional toys and tools in the home and outside, reading traditional print-based books and picture books, and drawing, cooking and doing other mundane activities in the house together with their parents. In addition, the children were found to use digital media as part of their other play activities in sequence and in parallel, such as searching for information for their tinkering, or singing and dancing while watching a video on YouTube; thus, we saw evidence of the children's hybridized literacy activities in which old and new artefacts and technologies and online and offline worlds dynamically interacted and merged (see also Marsh, 2014, 2016; Yelland and Gilbert, 2017). Often, in these digital literacy practices, we could see evidence of the children's creative agency.

Both parents mentioned the potential benefits of their child's engagement with digital technologies and media. For instance, Julia's mother thought digital technologies and media had contributed to Julia's interests and skills in dancing and singing, and learning the English language. These findings are somewhat similar to studies conducted in the US that have reported parents' positive views of their children's screen media use, citing benefits in learning, creativity and social skills (Rideout, 2017). In addition to these opportunities, the Finnish parents also expressed concerns and worries about their children's

digital engagement, such as the possibility that digital media might decrease the children's concentration or cause language delay. Here, Julia's mother explains her worries:

Sometimes I was bothered that when she watched the programs on the tablet or the phone, she may have watched them only a bit at the beginning, and then she changed to somewhere else, and I was annoyed because I'm restless by nature and my child may be too...so it [digital media] does feed that kind of behaviour.

Although this reflection shows the mother's awareness of what the child is independently doing with digital media, it was interesting to learn that none of the parents were concerned about harmful content their child might see in their autonomous digital literacy practices. None of the parents mentioned a need to support the child in critical awareness and reflection regarding their media use and practices.

The nature of the children's digital literacy practices

Next, we illustrate purposefully identified vignettes, derived from the entire data corpus via the intensity sampling method (Patton, 1990). Our vignettes make visible typical digital literacy practices of the children in their homes, with a specific interest in the operational, cultural, critical and creative dimensions of their digital literacy engagement. As these different dimensions of literacy do not operate in isolation from each other but overlap in various ways in situated practice (Green, 1988), we demonstrate our findings via the analysis of these vignettes in which the identified dimensions of digital literacy manifest themselves in interaction with each other in situ.

In Vignette 1, we show how communicating with the grandmother entailed the child's digital literacy practices across operational, cultural and creative dimensions. Vignette 2 demonstrates the child's operational, cultural and creative digital literacy practices in the context of making sounds with an app on an iPad, whereas Vignette 3 illustrates operational and cultural digital literacy practices that interact with a creative activity while the child makes a ladybug in her 'offline' activity. Taken together, the vignettes demonstrate digital literacy practices in which the children are decoding and encoding various texts for various purposes. They are also engaged in using the various tools, content and applications these practices require (operational dimension). The children also use different modes and signs of communicating and exploring the cultural rules of these practices (cultural domain). Last, but not least, the vignettes

illuminate the creative dimension of the children's digital literacy practices, which evidences the children's transformative agency in their engagement with digital media (creative domain).

Vignette 1: Communicating with the grandmother. Our first example illuminates Julia's digital literacy practices while communicating with her grandmother at a distance. This episode is initiated by Julia's mother, who notices on her own smartphone that Julia has received a text message from her grandmother. Her grandmother has written the text message with letters and emojis. Julia's mother reads the written part of the message aloud to Julia, and together, they read and interpret the emojis and discuss the meaning of the message. Julia's mother gives the phone to her, leaves Julia alone, and encourages her to respond to her grandmother. This encouragement leads Julia to respond to her grandmother by herself, and she writes a message with several emojis and sends it from her mother's smartphone (see Figure 1). Julia's message contains various images of animals and plants to communicate her experiences at the zoo. After Julia has written and sent the message, she shows it to her mother and they read the message aloud together.

This example shows how Julia's digital literacy practices were mediated by her mother and grandmother, but also by the digital media and its multimodal textual affordances (other than printed text). Julia does not see her grandmother often, but they are in touch almost daily due to the mediation of digital media. Her grandmother sends her messages with emojis, which Julia can read although she does not yet know how to read printed text and letters; her mother reads the written parts of the messages aloud. Julia is also able to respond to her grandmother with emojis, and in this way, actively shares narration about her day and the latest news. This digital practice demonstrates active engagement in the operational, cultural and creative dimensions of digital literacy. Here, Julia is communicating with her grandmother through a smartphone, encompassing learning to read and write multimodal text messages in creative ways.

Vignette 2: Joint playing with sounds. In this vignette, Emilia is sitting on a sofa using a music application that she has independently located while glancing through the different applications she is allowed to search on the tablet. In this app, different pictures make different sounds. At first, Emilia is just going through the pictures, tapping them one by one and listening to different sounds. Her father joins in to see what she is doing and, for a while, asks questions about the sounds and the app, but he eventually leaves her to make the sounds again



Figure 1. Julia is writing a message to her grandmother.

by herself. Soon Emilia becomes distracted, and she changes places from the sofa to the floor. After this, her mother joins her to see what she is doing. The child starts to play the sounds to her mother, and together, they get excited about tapping the pictures and creating the sounds, and they shake their bodies to the rhythm of the sounds.

In this vignette, we can witness Emilia's digital literacy practices in connection to her use of a sound-making app on a tablet. The sounds make her laugh, and she becomes interested in tapping the different sounds. Her mother gets excited about the sounds as well, and together, they start to create sounds. Here, Emilia's engagement is mediated by the sound-making app, her mother and the rules her parents have set for her usage of the tablet. The rules – that is, her parents giving her a certain amount of freedom in using the tablet – allow her to explore different applications, which results in Emilia locating a sound



Figure 2. Emilia is creating sounds with her mother.

creation application that attracts her attention. Our vignette also shows how Emilia's parents follow her from some distance and that they are interested in what she is doing. They let her play with the app, and in the end, her mother joins her to create sounds together (see Figure 2). Here, Julia is engaged in the operational and cultural dimensions of digital literacy as she explores and learns to use the tablet and the app for making music. Also, she engages in creative activity, making new sounds with the app.

Vignette 3: Joint searching for information online to make a ladybug. Our third vignette presents Julia's digital literacy practices with her mother in the context of making a ladybug from cardboard with scissors. In this vignette, Julia uses the tablet and the picture that Julia and her mother have located on the Internet to help Julia see a picture of a ladybug (see Figure 3). This making activity is initiated by Julia when she says that she would like to make a ladybug. Julia and her mother start to collect some materials for this tinkering. They decide to use the tablet to search for information online about the appearance of a ladybug. When Julia finds a picture that she likes, she starts to select the materials she needs to make the ladybug; with her mother's help, she starts to tinker. Occasionally, while making the ladybug, they go back to the picture online and discuss the next step to get the ladybug ready. Similar to the earlier

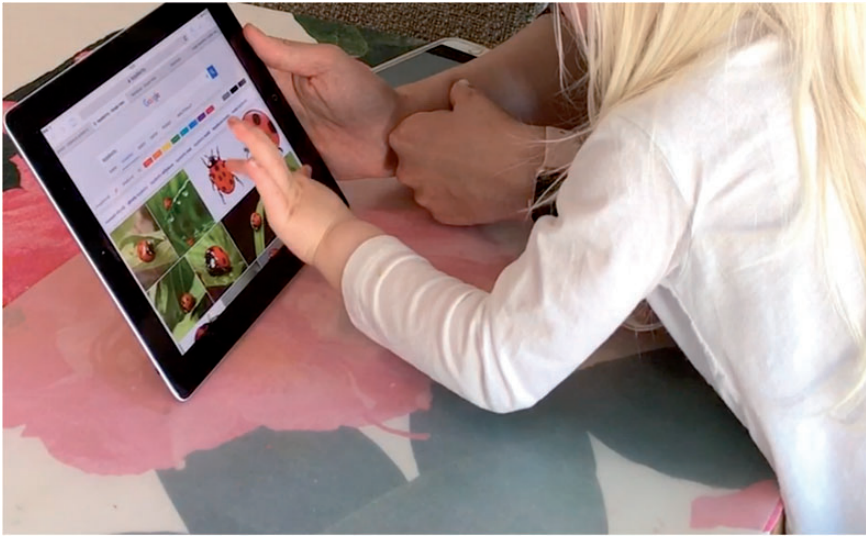


Figure 3. Julia and her mother are searching online for an image of a ladybug.

vignettes, this vignette demonstrates how operational and cultural dimensions of digital literacy are strongly present in the child's activity as she engages in using the tablet for searching for information and images about ladybugs and applying this knowledge to her offline creative activity.

Discussion

This study was designed to investigate two young children's digital literacy practices in Finnish homes along the operational, cultural, critical and creative dimensions. The rationale for this study stemmed from existing reviews of literature that concluded that, currently, there is a dearth of research knowledge on young children's digital literacy practices in their homes (Kumpulainen and Gillen, 2017, 2019). Generally, it appears that more attention has been paid to older children and the risks and threats of digital media in children's lives, with less attention being paid to the actual nature of young children's digital literacy practices in context (Livingstone, 2016; Livingstone et al., 2017a). However, knowledge regarding young children's digital literacy practices in the sociocultural context of the home is pivotal to furthering the current understanding of children's everyday lives, literacy learning and well-being in the digital age. The present study offers new understandings of young children's digital literacy practices and emergent literacy learning

opportunities, which are important to analyse and document for theory, practice and policy.

The findings illuminate the multimodality of the children's digital literacy practices in their homes, which involve various digital tools and media contents ranging from videos to interactive games or apps on tablets or smart-phones, but could also involve and innovatively hybridize non-digital practices. However, the children's everyday lives were not only permeated by digital technologies and media, but the digital literacy practices were intertwined with non-digital activities according to the daily rhythm of the families. The children's digital literacy practices, particularly when child-initiated, often crossed online/offline and material/immaterial boundaries and, as a consequence, created multidimensional, playful and dynamic digital literacy practices, with a distinct orientation towards the creative dimension of literacy (see also Danby, et al., 2018). These findings suggest that children's emergent digital literacy practices in the home are developed through complex and hybrid multimodal and multimedia communicative acts in context.

The children's digital literacy practices were mediated by the sociocultural contexts of their homes, including the nature of digital media at their disposal and the rules, objectives and social interactions between the child and adult(s). In the two families who participated in our study and who represented socio-economically advantaged families, there were jointly agreed rules for the child's digital media use in terms of both time and content. These rules applied to regulating the children's screen time and use of content. In both families, the children showed evidence of being able to adhere to the rules they had made together with their parents concerning their use of the technology and to discuss and negotiate these rules with their parents. Therefore, our study points out how each child's agency in her use of digital technologies and media was intertwined with her accountability to joint rules that mediated their engagement with digital media in the home. That is, the children were offered 'open spaces' to enact agency while, at the same time, the parents tried their best to ensure the children's safe and purposeful use of digital media. The findings of our study also suggest that children's opportunities to interact with adults in a meaningful way in a stress-reduced environment foster positive use of digital technologies and media. It is not the media themselves that foster this positive use.

The children's digital literacy practices were found to range from independent engagement with digital technologies to joint media engagement with a parent(s). The child's independent use of digital technologies and media was often initiated and structured by the daily rhythm of the family, typically

accommodating the parent's need to manage the household and take care of mundane but important routines, such as making lunch. We also identified shared digital literacy practices between a child and parent, initiated by both the children and their parents, as demonstrated by our vignettes. Such joint media engagement and interaction with an adult is known to be important for children's developing literacy and knowledge construction, as well as critical and creative thinking (see, e.g. Kucirkova et al., 2015; Neumann, 2017; Takeuchi and Stevens, 2011; Zack and Barr, 2016; Zimmermann et al., 2016).

The children's creativity manifested in digital literacy practices that allowed them to make choices and to take active, interactive and creative positions with and around digital technologies and media. We could identify digital literacy practices in which the children's interests shaped their use of digital technologies and media, and also in which a particular medium fostered the child's consumption of specific cultural texts. For example, Julia moved seamlessly across the home TV, tablet and her digital play recorder, and vice versa, to engage in singing and dancing the same piece of music. Altogether, the study echoes Marsh (2016) and points out that traditional language theories alone are no longer sufficient to describe or explain the many different modalities, and the interrelationships between them, that characterize children's contemporary literacy practices and learning opportunities in the digital age.

The study shows that the children's digital literacy practices featured operational, cultural and creative dimensions of literacy, indicating the children's enculturation into and production of social and cultural aspects of digital literacy. Often, these practices were situated in communicating with important others at a distance in multimodal ways via a smartphone (Vignette 1), in creative activities with a tablet and its applications, such as making music (Vignette 2), and using the tablet to search for information online and applying this information to creative activities offline (Vignette 3). The children also demonstrated creative agency, overcoming existing constraints, hybridizing digital media with non-digital activities in playful ways and developing something new. However, the critical dimension was not as apparent in the children's digital literacy practices as the other three dimensions. There were no instances, for example, in which the children were engaged in discussing or evaluating the actual contents of media they were using or producing together with their parents. Neither did we identify interactions in which the children would have engaged in considering the best ways to communicate their texts and artefacts. These findings point to the need to raise parental awareness in supporting young children's critical digital literacy practices and consequent literacy learning opportunities.

The implications of our findings for early childhood education are important, as educators need knowledge about children's changing home literacies and digital literacy practices in order to provide adequate support for children's emergent literacy learning. The findings underscore the importance of providing educators and caregivers with information and guidelines that explain how to foster children's critical awareness and reflection on their digital literacy practices, with recommendations as to how to select quality content to optimize media experiences and learning opportunities for young children. Our conceptual analysis framework also offers educators a tool to observe and critically reflect on children's digital literacy practices across operational, cultural, critical and creative dimensions, guiding their digital pedagogies and interactions with children.

The findings speak to the instructional design of media content for children. Children's critical engagement in their digital literacy practices could be supported by media producers in designing tools or content that enable critical analysis and reflection. Also, early years practitioners could develop pedagogical practices that support and enable young children to engage in critical self-reflection, thereby furthering children's development of a 'critical disposition' concerning their digital literacy practices (Pangrazio, 2016: 168–169). These developments are very important, as research has suggested that when appropriately supported, even young children can operate effectively as digital authors and readers, navigating technological worlds with confidence and competence relative to their age (see also Marsh, 2016).

At the same time, while reporting our results, we understand that the present study is small-scale, descriptive and the findings are not generalizable. Our study is also limited in terms of the characteristics of the research participants, as they represented families with medium–high socio-economic standing in the cultural context of Finland. It should also be noted that both of the case study children were young females, which further limits the study. Nevertheless, we believe our study holds the potential to illuminate the situated nature of children's digital literacy practices at home across operational, cultural, critical and creative dimensions, and to offer insights into the socio-cultural processes that account for these literacy practices and emergent literacy learning opportunities. This entails making visible how these two young children were engaged in digital literacy practices and learning about cultural values, traditions and tools and, equally, learning to use these cultural tools (i.e. digital technologies and media) in personally meaningful ways. In this study, these digital literacy practices were shaped by a responsible parenting style that respected the child's interest and autonomy. These findings provide

important lessons for policymakers, digital content developers and parents and educators working with young children.

Our study also demonstrates how the day-in-the-life methodology (Gillen and Cameron, 2010; Gillen et al., 2007) can act as a prominent, contextually sensitive research tool to capture the nuanced processes in children's everyday digital literacy practices, which are acknowledged by earlier research as being difficult to examine (e.g. Tour, 2017). This methodology resonates well with the sociocultural approach, which holds that literacy practices must be analysed and understood at the nexus of interlinked dimensions in context. These practices include moment-to-moment interactions whereby literacy practice is situationally constructed into being, the sociocultural context, the resources available to the child and finally the continuity and development of situational manifestations of literacy practices across time and space. Although our study covered only one day in the lives of the children, amplified by interviews, the study points to the benefits of over-time research in making visible children's digital literacy practices and emergent literacy learning opportunities. The use of this method, however, requires that researchers be appropriately trained with the actual method and its ethics. The day-in-the-life methodology also calls for sensibility and flexibility from researchers in respecting and listening to the families, both children and adults, and their wishes in terms of data collection and interpretation of the findings.

Conclusions

This study speaks to the importance of further research on young children's digital literacy practices and emergent literacy learning opportunities in varied homes with varied resources, rules, values and practices. The study points out that public debate and policy should move away from a mere focus on children's screen time or risks to an increased focus on content and context. Measuring screen time or other risks fails to detail the child's media experience, including the nature and content of children's digital literacy practices and their learning opportunities (Huber et al., 2018).

The overarching argument confirmed by this study is that there is a need for more socioculturally nuanced research on young children's digital literacy practices in the everyday life of the home and on how these practices support children's learning of digital literacies and build up opportunities for children's digital literacy as empowered citizens. There is a need for longitudinal and contextually nuanced research to identify conditions for digital literacy practices that provide equal support for the operational, cultural, critical and creative dimensions of literacy; to uncover what values and outcomes are

thereby advanced; and to determine what conditions can prevent the digital realm from magnifying the inequalities that already exist in other areas of children's lives. We also need more studies that look into how the cultural and socio-economical standing of families influences and interacts with young children's digital literacy practices and learning opportunities in the home. The present study was particularized to a particular context – Finland – and the participants were from more socio-economically advantaged backgrounds. Also, the children in the families were both females and there were no older siblings in the family. Hence, further research is welcome regarding the similarities and differences in how parents and children of varying backgrounds and gender interact with digital technologies and media and how the age and number of the children in the family are associated with children's digital literacy practices and emergent literacy learning opportunities.

Future studies should focus on understanding why and how some children benefit from their use of digital technologies and media, while others seem to be impacted negatively. Evidence-based models that identify and analyse diverse children and families need to be developed, taking into account diversity of age, ethnicity, gender and cultural, social and economic background, as well as family size, including the number of siblings in the family. The (lack of) equity of access to digital media across social groups also needs to be considered. Moreover, scholars should consider how to better involve children and parents as active collaborators in research on digitizing childhoods.

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